

REMARKS

Claim 5 is pending. Claims 1-4 and 6-9 have been canceled without prejudice or disclaimer, as drawn to non-elected inventions. Claims 35-40 have been added and therefore are pending in the present application. Claims 35-40 are supported by the specification and claims as originally filed, including at page 4, lines 10-11, and at page 9, line 14 to page 10, line 27.

It is respectfully submitted that the present amendment presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the above amendments and the following remarks is requested.

I. The Rejection of Claim 5 under 35 U.S.C. 112

Claim 5 stands rejected under 35 U.S.C. 112, first paragraph, as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. The Examiner contends that the claims are directed to methods of using all possible three-dimensional structures of any alpha-amylase, and the Examiner concludes that the specification does not provide sufficient written description support for such subject matter.

As amended, the claims recite that the parent maltogenic alpha-amylase is at least 70% identical to SEQ ID NO:1 and the method includes the step of "modeling the parent alpha-amylase on the three-dimensional structure of SEQ ID NO: 1 depicted in the Appendix to produce a three-dimensional structure of the parent alpha-amylase."

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 112. Applicants respectfully request reconsideration and withdrawal of the rejection.

II. The Rejection of Claim 5 under 35 U.S.C. 112

Claim 5 stands rejected under 35 U.S.C. 112, first paragraph, as allegedly non-enabled. The Examiner states that although the specification is enabling for a method of constructing a variant of an alpha-amylase using the three-dimensional crystal structure of SEQ ID NO:2 depicted in the Appendix, that the specification allegedly does not provide enablement for constructing a variant of any alpha-amylase using any three-dimensional structure.

As amended, the claims recite that the parent maltogenic alpha-amylase is at least 70% identical to SEQ ID NO:1 and the method includes the step of "modeling the parent alpha-amylase on the three-dimensional structure of SEQ ID NO: 1 depicted in the Appendix to produce a three-dimensional structure of the parent alpha-amylase."

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 112. Applicants respectfully request reconsideration and withdrawal of the rejection.

III. The Rejection of Claim 5 under 35 U.S.C. 102

Claim 5 stands rejected under 35 U.S.C. 102 as allegedly anticipated by Svendsen et al. The Examiner states that Svendsen et al. teach the claimed method for constructing a variant of a parent alpha-amylase using the three-dimensional structure of said parent alpha-amylase to make a variant having altered property, including an altered pH dependent activity.

As amended, claim 5 recites that the parent maltogenic alpha amylase is at least 70% identical to SEQ ID NO:1. The alpha-amylase of Svendsen et al. is not a maltogenic alpha amylase and is less than 70% identical to SEQ ID NO:1. Therefore, Svendsen et al. does not anticipate the claimed invention.


For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 102. Applicants respectfully request reconsideration and withdrawal of the rejection.

IV. Conclusion

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Cherry et al.

Confirmation No: 7060

Serial No.: 09/607,142

Group Art Unit: 1652

Filed: June 29, 2000

Examiner: Fronda, C

For: Maltogenic Alpha-Amylase Variants

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Sir:

Below is a marked-up version of the amendments made in the accompanying amendment.

IN THE CLAIMS:

Claim 5 has been amended as follows:

5. A method of constructing a variant of a parent maltogenic alpha-amylase, wherein said parent maltogenic alpha-amylase has an amino acid sequence which is at least 70% identical to SEQ ID NO: 1, which method comprises:

a) modeling the parent alpha-amylase on the three-dimensional structure of SEQ ID NO: 1 depicted in the Appendix to produce a three-dimensional structure of the parent alpha-amylase;

[a)] b) identifying an amino acid residue which is within 15 Å [(in particular 10 Å)] from an active site residue of the parent amylase in the three-dimensional structure of said parent, and which is involved in electrostatic or hydrophobic interactions with an active site residue;

[b)] c) substituting said amino acid residue with another amino acid residue which changes the electrostatic and/or hydrophobic surroundings of an active site residue, and which can be accommodated in the structure;

[c)] d) optionally repeating steps [a) and b)] b) and c) recursively;

[d)] e) optionally, making alterations each of which is an insertion, a deletion or a substitution of an amino acid residue at one or more positions other than [b)] c),

[e)] f) preparing the variant resulting from steps a) – [d)] e);

[f)] g) testing the pH dependent activity of said variant; and

[g)] b) optionally repeating steps a) – [f)] g) recursively; and
[h)] i) selecting a variant having an altered pH dependent activity as compared to the parent amylase.